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ABSTRACT

This report describes and evaluates the first year of a demonstration project to develop an on-demand telecommunications network linking four remote hospitals in southwestern Ohio to the University of Cincinnati Medical Center. The Telecommunications Information Network (TIN) is designed to allow health care professionals at those hospitals to access information resources by utilizing the slow-scan video and interactive audio system. The evaluation of the outcomes of this project was achieved through the development and use of data collection instruments designed to measure specific behavioral objectives, while the evaluation of the process involved in establishing and maintaining the network was achieved through interviews, conversations, and work diaries kept by the project staff. Quantitative data analysis centered on the number of requests received, types of users, use of requested information, TIN requests where slow-scan was not used, interlibrary loan statistics for site hospitals, and resources used for TIN requests. Qualitative analysis focused on the establishment of TIN, the development of a marketing strategy, and the establishment of a project review council. Fourteen references are cited. Appendices provide a TIN equipment list, a network model, a project schedule, TIN newsletters and pamphlets, and a statement of TIN policies. (PM)

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UNIVERSITY OF CINCINNATI

MEDICAL CENTER

ANNUAL REPORT
ON

TELECOMMUNICATIONS INFORMATION NETWORK:

A MODEL FOR ON-DEMAND TRANSFER

OF MEDICAL INFORMATION

(DHEW 041A - 7901)

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I. SUMMARY

A. OVERVIEW

The first year of this demonstration project accomplished the development of an on-demand telecommunications network linking four remote hospitals in Southwest Ohio to the University of Cincinnati Medical Center. It allows health-care professionals at these hospitals access to resources ordinarily not available to them by utilizing the slow-scan video and interactive audio system. Information specialists at the Health Sciences Library and Drug and Poison Information Center research questions, which are telephoned from the site hospitals, and respond with the appropriate information via telephone and/or slow-scan television.

In the four months that the Telecommunications Information Network has been fully operational it responded to over 120 requests for information. Many of the requests were from physicians with the remainder coming from a wide range of health-care professionals including: nurses, pharmacists, administrators, in-service directors, and various therapists. The primary use of the requested information was for patient treatment (42.2%), however, teaching (17.8%) and personal knowledge (15.6%) were also important. Use of the network is closely related to the size of the hospital and the size and quality of its library. Use is not effected by the ability to obtain a hard-copy print of slow-scanned information.

The network was originally established to handle quick medical questions, however, the questions researched were longer, in-depth research requests demanding significantly more research time and requiring a less immediate response. As a result of this unforeseen development, the interlibrary loan and computerized bibliographic search systems at the Health Sciences Library become part of the response network for this project. The quick on-demand medical questions appear either not to exist or are being answered by collegial networks or other existing resources.

B. MAJOR ACCOMPLISHMENTS

In addition to the interim evaluation of the Telecommunications Information Network, there have been a number of major accomplishments in Year 01 of this project. These accomplishments range from the establishment of an information network, both human and technological, the development of an evaluation framework and the exploration of a number of issues surrounding the role of telecommunications in information management. The specific major accomplishments of Year 01 of this demonstration project are:

- Establishment of the Telecommunications Information Network
- Establishment of a human resource network
- Development of research methodology and protocol
- Expanded baseline data
- Establishment of closer links between the four site hospitals and the U.C. Medical Center

- Establishment of links with other networks and institutions
- Exploration of expanded potential of slow-scan technology
- Development of a marketing strategy for the Telecommunications Information Network
- Establishment of a Project Review Council

II. DESCRIPTION OF THE TELECOMMUNICATIONS INFORMATION NETWORK

A. INTRODUCTION

The Telecommunications Information Network (TIN) is a unidirectional slow-scan television system with interactive audio. The evaluation of this system as a means of transferring on-demand medical information from a major medical center to health professionals in four remote settings is a major goal of the project. Another goal is to evaluate the acceptability of this system by health-care professionals.

B. PURPOSE

1. The Problem

"No physician knows enough to give all his patients ideal care and as medical knowledge expands, there is an ever-increasing gap between what medical information is known and what one physician can know" (West, 1966). Essential information resources, both literature and human, are far more numerous and accessible to health practitioners in major medical centers than to those in rural areas. Yet, as the Appalachian Regional Commission needs assessment indicated, "rural physicians and physician assistants needed access to specialists, information search and retrieval systems, and continuing medical education. Nurses needed drug applications, drug use and abuse information, and drug interaction data . . ." (Mertens and Bramble, 1976). "The real problem involves getting the available medical information quickly to those who need it most" (Wood, 1972). Health-care professionals want more than literature citations; they want assistance in finding the most appropriate references pertinent to specific clinical problems and evidence-based answers to specific questions.

2. The Human/Technology Interface

Medical information is essential for total health care in remote locations, but major information centers cannot be practically replicated. Because it is not economically feasible to provide major information resources, searching services, and consultants in each remote hospital, a more realistic approach is to make the existing resources of a large well-equipped facility available to the remote practitioners. Telecommunications appears to offer a practical means of linking centralized resources and the remote health-care professional.

TIN bridges the gap between information needs and information resources through the use of slow-scan technology. Slow-scan telecommunications facilitates the transfer of on-demand medical information to health professionals in urban and rural settings remote from a major medical center; thus it enables the practitioners to quickly access a large body of information ordinarily unavailable to them. The rapidity with which information resources are retrieved allows the most recent information to become an integral part of a health professional's decision-making process. As medical knowledge expands, the effectiveness of patient-care increasingly depends upon the health professional's ability to retrieve the most current information quickly.

C. TARGET

TIN provides visual medical information from the University of Cincinnati (U.C.) Medical Center to four remote hospitals. With the continuing realization that a maldistribution of medical information and medical manpower exists, the Telecommunications Information Network is providing information essential to the non-medical center health professional. This ready access to medical information enables health professionals at the four sites to make patient-care decisions based on the most current information available. TIN allows all members of the health-care team -- physicians, nurses, pharmacists, administrators, technicians, etc. -- to have access to the resources of a comprehensive medical center.

D. SETTING

1. Four sites

The four hospitals involved in this project are representative of the majority of hospitals in the United States. They were selected because (1) they typify (in terms of size, staffing, and other factors) the variety of hospitals found in the country, (2) they have identified the need for the types of service proposed in this applications, and (3) they are supportive of our applied approach for meeting their needs.

Brown County General Hospital in Georgetown, Ohio, approximately 50 miles from Cincinnati, is a 152-bed general hospital serving a Southern Ohio Appalachian county. Brown County General Hospital is part of the Health Education Alliance through the University of Cincinnati (HEALTH-U.C.) program which is designed to train medical practitioners in a rural setting with the hope that they will eventually decide to practice there. Information sources at Brown County General Hospital are limited but are developing.

Clermont County Hospital is a 63-bed general hospital located in Batavia, Ohio, and serves the Appalachian County immediately east of Cincinnati. Situated within a community in transition from rural to suburban area, Clermont County Hospital is expanding as Cincinnati's population grows. Information resources at Clermont County Hospital are minimal with no organized library.

Mercy Hospital is the larger of two hospitals serving Hamilton, Ohio, a small city (65,000 population) located approximately twenty-five miles from the U.C. Medical Center. A church-operated 340-bed general hospital, Mercy Hospital services a wide range of patients from its urban, suburban, and rural community. The information resources of Mercy Hospital are well-equipped with a professional librarian who provides library services and maintains a good hospital collection of materials.

Bethesda Hospital North is a 240-bed suburban hospital located in northeast Cincinnati. Affiliated with the 480-bed Bethesda Hospital in downtown Cincinnati, Bethesda North has a very active Emergency Room and high (98%) occupancy rate. A medical library has recently been provided onsite and a professional librarian offers informational services.

2. U.C. Medical Center

The U.C. Medical Center is a regional health-care center for Southwest Ohio and parts of Kentucky and Michigan and has a long-standing commitment to the health community it serves. The U.C. Medical Center is a leading center for research and its 700 faculty members, together with medical residents and other hospital staff, provide a strong resource group of medical specialists to be utilized by the Telecommunications Information Network. These content liaisons from clinical departments of the U.C. Medical Center are able to provide responses to specific questions from the health professionals at the four site hospitals.

Television cameras and staff for the project are located in the Telecommunications Information Network Office of the Health Sciences Library and in the Drug and Poison Information Center at the U.C. Medical Center. The combined resources of these two locations (i.e. literature, data, and information specialists) form the foundation for the information services provided by the network.

The Medical Center Libraries forms one of the five units of the U.C. Medical Center and serves as the information resource center for the other four units: the College of Pharmacy, the College of Nursing and Health, the College of Medicine, and the Cincinnati General Hospital and Holmes Hospital. In addition to the Health Sciences Library, the Medical Center Libraries includes the Nursing and Health Library, the History of Medicine Library, and the Media Resources Center. Many services, both traditional and innovative, are available at the Medical Center Libraries to fill the informational needs of both the U.C. Medical Center and the Greater Cincinnati community of health professionals.

The Drug and Poison Information Center has six years of experience in providing on-demand drug and poison information to medical professionals in a rural setting. The Drug and Poison Information Center is a 24-hour service for the medical and lay communities of the Greater Cincinnati area and responds to over 36,000 requests per year. The overall objective of the Drug and Poison Information Center is to promote rational practices in drug usage at all levels of society.

The Medical Center Libraries, the Drug and Poison Information Center, and the Department of Biomedical Communications cooperated in an information via television project providing primarily drug information services to personnel within U.C. Medical Center affiliated institutions. Funded by the National Library of Medicine, the initial project developed and evaluated a model for innovative medical information retrieval, analysis, and dissemination system. The research project demonstrated the usefulness of visual communications of medical information in the delivery of patient care and was continued after funds terminated.

E. METHOD

1. Slow-Scan Technology

The slow-scan with interactive audio transmission system established at two locations in the U.C. Medical Center links four remote hospitals (two rural, one suburban, and one urban). Transmission centers are located in the TIN Office of the Health Sciences Library and in the Drug and Poison Information Center. From the two U.C. Medical Center locations, information (in the

form of both resources and content experts) can respond to specific needs when the "need-to-know" arises.

The service is provided by the staff of the Drug and Poison Information Center and the Project Librarian and reference staff of the Health Sciences Library. A multiple-line telephone patching device is also available in the TIN Office enabling consultation with specialists in the U.C. Medical Center.

Slow-scan is television in which the video signal is compressed to a band-width suitable for transmission over voice-grade telephone lines. At the reception site the signal is expanded and viewed over a television monitor.* Slow-scan is an inexpensive and efficient alternative to live video, which requires extensive construction and equipment costs necessary to transmit the more conventional television signal. Any still image -- printed pages, microfiche, slides, X-rays, three-dimensional models -- may be reproduced; transmission time takes approximately 75 seconds. Two of the four site hospitals also have the capacity to receive hard-copy prints of the information over the same telephone line (See Appendix B).

The Telecommunications Information Network is activated when a health-care provider at one of the sites has a medical question. He telephones the Drug and Poison Information Center for drug-related questions and the Telecommunications Information Network Office for any other medical questions. The information specialists at these locations then research the question using all available resources. If the question can be answered orally then the response is given over the telephone. If a visual image can more effectively answer the questions, then the slow-scan television system is used. If additional consultation is needed then a three-way conference calling system can be used which allows a medical specialist to participate in the conversation.

2. Expanding Use of Technology

TIN has potentials far beyond its present use. It was discovered in the initial operational stages of the system that the slow-scan signal could be recorded onto a standard cassette tape. This recording ability allows the storage of frequently transmitted items, saving the time it requires to retrieve the relevant information and adjust the transmitting equipment. It also allows the site hospitals to store information sent via slow-scan.

It is also possible to use a stereo cassette recorder to record the video signal on one channel and a corresponding voice track on the other. The present Telecommunications Information Network could be expanded to allow a health-care provider with an information need to be sent both a picture via slow-scan signal and voice narrative. This could be recorded and played back at the requestor's convenience.

Slow-scan technology may also be used to provide continuing medical education to remote health-care personnel. Thus, in addition to the provision of on-demand information concerning patient-care, informational programs about new developments in the health fields could be made available to the health professionals at remote locations. Educational slow-scan telecommunications programs could be offered on specific topics in the remote medical setting either through the cooperation of existing continuing medical education programs or the creation of a new regional locus for meeting informational needs.

* For a listing of the equipment used for this project, see Appendix A.

F. TRANSFER POTENTIAL

Inherent in this proposal is the realization that it is an innovative model for an on-demand medical information transfer system that will have national implications. The utilization of this system can have a direct and positive impact in improving the quality of care in the health-care system. Currently, there are approximately 150 major medical centers in the United States. Slow-scan has the potential to radiate medical information from each of these centers, thereby linking major information resources and searching methods with health-care professionals in non-medical center areas.

IVI. DESCRIPTION OF THE EVALUATION STUDY

The major focus of this demonstration project is to develop and evaluate a channel through which health-care providers can rapidly receive answers to medical questions. Implicit in this is the assumption that this channel will improve health-care by making the most current information available to health-care providers. It also has the potential to reduce professional isolation that is felt by many health-care providers practicing in rural or remote areas. This evaluation, however, is aimed specifically at the effectiveness of this network in providing on-demand health-care information.

This report is concerned with both the evaluation of the outcomes of this project and the process involved in establishing and maintaining the Telecommunications Information Network. The former is achieved through the development and use of data collection instruments designed to measure specific behavioral objectives. The latter is achieved through interviews, conversations, and the work diaries kept by the project staff.

A. GOALS

- To evaluate telecommunications as a means of transferring medical information from a major medical center to health professionals in both urban and rural settings. The telecommunications network will allow project staff and a variety of content specialists with training and experience in health sciences disciplines to transmit medical information pertinent to questions posed by health-care professionals in urban and rural settings.
- To determine the feasibility of a large medical center satisfying the information needs of health-care professionals in rural and suburban communities, by utilizing telecommunications technology.
- To evaluate the information-seeking behavior of rural and health-care professionals as impacted by slow-scan transmission of information and an interactive audio system.
- To evaluate the types of patient-care questions presented to the telecommunications information transfer system.

B. OBJECTIVES

1. To make available in rural areas visual as well as voice-access to health-care information resources currently available in the University of Cincinnati Medical Center, but essentially elsewhere in Southwest Ohio.
2. To study the impact of medical information via television services offered to sites that represent a cross-section of hospitals found in rural and suburban areas throughout our country.
3. To determine the feasibility of transmitting medical information to monitor locations at four rural and suburban hospitals from the Cincinnati Medical Center.

4. To determine the cost-effectiveness for transmitting information via television through slow-scan to each of the remote receiving sites.
5. To determine the impact of specific monitor locations on the use of the system at the four receiving sites.
6. To determine the user satisfaction of the proposed system at the four receiving sites.
7. To compare the types of information requested through the system from the four receiving sites.
8. To determine if the information transfer system has any impact on the information-seeking behavior of the health professionals in the remote receiving sites.
9. To determine the role of public relations in a telecommunications project by utilizing different methods in the remote sites and to outline the most feasible methods to encourage the highest utilization.
10. To determine the types of users and types of information requested over slow-scan versus slow-scan with hard copy.
11. To document the experience of the project staff in designing, implementing, and evaluating the program.
12. To identify areas of continuing medical education needs in hospitals associated with this project via reference/literature usage.
13. To evaluate the utilization of library resources through the changes in the Interlibrary Loan system.

Two additional objectives were developed to analyze other aspects of the Telecommunications Information Network not covered by the original thirteen. Objective 14 is, "To evaluate the utilization of the three-way conference calling system and the use of medical residents and medical center faculty as consultants in conjunction with the slow-scan transmission of information." Objective 15 is, "To evaluate the effectiveness of the Telecommunications Information Network when an intermediary facilitator is used to relay questions to the information specialist versus direct contact between the requestor and the information specialist."

C. OUTCOME MEASURES

1. Instruments Used

Since most of the objectives reflect various aspects of the use of this system, the most important unit of analysis is the individual requests for information. Figure 1 shows the instrument used for this purpose. It has been tested, evaluated, and updated to collect the essential data most efficiently. The foci of this request form are: (1) demographic information on the requestor; (2) the request; (3) the research process and resources utilized; (4) the response; and (5) an evaluation of the response and network effectiveness by the requestor.

Background information on the requestor and on specific questions (questions 1 - 9) are asked by the information specialist at the time of the initial request. Information concerning the response and the resources used in the response are filled out while the question is being researched by the information specialist (questions 10 - 19). After the response is conveyed to the requestor, a series of questions concerning the response and the Telecommunications Information Network are asked of the requestor by the information specialist (questions 20 - 25). This information request form is filled out on every request taken through the Telecommunications Office at the Health Sciences Library.

The Drug and Poison Information Center is currently researching any question it received from both health-care providers and the general public in the Cincinnati area. They have been collecting data on these requests for several years. Requests made through the Telecommunications Information Network to the Drug and Poison Information Center are recorded on their standard data collection forms (Figure 2). This form is very similar to the information request form used in the Telecommunications Office in the Health Sciences Library. After final evaluation of both forms, a single form will be developed. Since data collection has been in operation less than four months, there is minimal data with which to do an in-depth analysis of requests through the Telecommunications Information Network.

To become an information resource for health-care providers at remote sites, the network must be congruent with present information-seeking modes of these health-care providers. A questionnaire was developed to help uncover these modes and to access other demographic characteristics of this professional population (Figure 3). The data from this questionnaire can be used to develop profiles of the professionals at each hospital site, providing insights into usage patterns of the Telecommunications Information Network. These profiles can also be used to help tailor the network to information-seeking behaviors at each hospital.

To provide data for the process analysis of Year 01 of this project, extensive logs and diaries were kept by the project staff. These contain records of travel, conversation, problems, meetings, and other information relevant to the development and maintenance of the Telecommunications Information Network.

2. Data Collection Procedures

Data from individual requests for information through the Telecommunications Information Network are noted on information request forms (the form in Figure 1 is used by the TIN staff in the Health Sciences Library and Figure 2 is used by the staff of the Drug and Poison Information Center). These forms are filled out by the information specialists at both locations. The information on these forms are then coded and keypunched and kept in a permanent data file.

An attempt was made to distribute the background survey (Figure 3) to all health-care providers at the four hospital sites in June 1979. We experienced difficulties in dealing with hospital distribution systems and later discovered that most health-care providers had not received the questionnaire. Of those who did receive it, the response rate was unusually low. A second

mailing of this data is scheduled for March, 1980. The data from the survey will be used to complement qualitative data gathered on each of the hospitals. The data survey will also be coded, keypunched, and kept on a permanent data file.

Logs, diaries, and other files have been recorded and maintained by the project staff. These logs are updated on a periodic basis. Files containing letters, memos, and other documents are updated daily and reviewed periodically. Project diaries kept by the TIN staff reflect many interviews and informal conversations with health-care providers, hospital administrators, facilitators, and other individuals interfacing with the project. Since these diaries are kept by various members of the staff, they therefore reflect individual perceptions of the project staff.

Data Collection Instrument

1. Transaction # _____ 2. Date ____/____/____ 3. Time ____:____ am/pm (circle)

4. Requestor _____

5. Hospital _____

6. Request:

7. Location: Primary or Auxiliary (circle)

8a. Position of requestor:

8b.

____ Physician _____ For Self

____ Nurse _____ For Physician

____ Pharmacist _____ For Other (specify)

____ Librarian _____

____ Medical Student _____

____ Other _____

9. Use of Information

1. ____ in selecting a patient treatment approach
2. ____ in changing a patient treatment approach
3. ____ in explaining an observation in a patient
4. ____ to add to personal knowledge
5. ____ for teaching purposes
6. ____ for research purposes
7. ____ other (specify)

Response: 10. Date ____/____/____

11. Time ____:____ am/pm (circle one)

12. A request for additional services was made

____ MEDLINE

____ ILL (a copy of a resources used in response)

____ Other (specify)

13. Resources used for response:

RESOURCE (COMPLETE CITATION)	USEFULNESS OF INFO			HOW INFO CONVEYED	
	rej. as to find	rel- useless	other evant	over phone	slow- scan
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					

14. Approximate amount of time to research the question:

____ less than 10 minutes

____ 10 minutes to 1 hour

____ 1 hour to 1 hour

____ 1 hour to 3 hours

____ 3 to 5 hours

____ more than 5 hours

15. Information provided by:

Pharmacologist/Phar. D./Pharmacist _____ (names)

Pharmacy, Tech. _____

Librarian _____

Other (specify) _____

Figure 1

16a. MEDLINE search done:

Yes _____ No _____

If Yes,

b. Search was helpful to
information specialist

Yes _____

No _____

Somewhat _____

17a. Was Slow-scan used?

Yes _____ No _____

If Yes,

b. Number of transmissions _____

c. Total Slow-scan time _____
_____ < 5 minutes
_____ 5 - 15 minutes
_____ > 15 minutes

18a. Were photocopies made?

Yes _____ No _____

b. If Yes,

Number of copies _____

c. If No copier available: Do you think a hard copy printer would be useful
in the transmission of this information?

Yes _____ No _____ Not sure _____

19a. Was three-way conference calling used?

Yes _____ No _____

If Yes

Who was contacted?

b. Department: _____

c. Name: _____

d. Status: faculty _____ resident _____ Other (specify) _____

20. Response to question: _____

21. Slow-scan Television: _____

22. Photocopies: _____

23. Three-way conference calling: _____

24. Over-all service provided by the T.I.N.: _____

25. Other comments:

Please rate the following aspects of this transaction with the Telecommunications Network:

20. Response to question:

- 1 Excellent
- 2 Satisfactory
- 3 Fair
- 4 Unsatisfactory (why?) _____
- _____
- 5 Poor (why?) _____
- _____

21. Slow-scan television:

- 1 Critical
- 2 Very useful
- 3 Useful
- 4 Of minimal usefulness
- 5 Not useful (why?) _____
- _____

22. Photocopies:

- 1 Critical
- 2 Very useful
- 3 Useful
- 4 Of minimal usefulness
- 5 Not useful (why?) _____
- _____

23. Three-way conference calling:

- 1 Critical
 - 2 Very useful
 - 3 Useful
 - 4 Of minimal usefulness
 - 5 Not useful (why?) _____
-

24. Overall service provided by the Telecommunications Information Network:

- 1 Excellent
 - 2 Satisfactory
 - 3 Fair
 - 4 Unsatisfactory (why?) _____
-

- 5 Poor (why?) _____
-

Caller _____

 location _____
 Department _____

 Phone Number _____

On behalf of
physicians?

____ Physician
____ Med Student
____ Pharmacist
____ Nurse
____ Other specify _____

1 ___ in selecting a patient treatment approach
2 ___ in changing a patient treatment approach
3 ___ in explaining an observation in a patient
4 ___ to add to personal knowledge (7-12) ☐
5 ___ for teaching purposes
6 ___ for research purposes
7 ___ other (specify) _____

SLOW-SCAN HOSPITAL ☐

43 Provider (P,T,S,) _____
 Needed help from _____ &/or
 (specify) _____

- 1 = Satisfy curiosity, immediate application
- 2 = Satisfy curiosity, not immed. application
- 3 = Encourage seek prof. help
- 4 = Encourage compliance (follow doctor's orders verbatim)
- 5 = Encourage intell. non-compliance or second professional opinion
- 6 = Discourage unwise behavior
- 7 = Allay patient fears
- 8 = Correct public misinformation
- 9 = Other

Figure 2

DRUG AND POISON INFORMATION CENTER
DATA COLLECTION INSTRUMENT

22

RESOURCE (incl. vol., page; define classification and card number)	USEFUL	USELESS

• USE REVERSE SIDE IF
MORE SPACE IS NEEDED

SIGNATURE

(1'-5')

(6'-19')

(20'-31')

(34'-47')

(39-42)

23

136 2

BASELINE DATA: HEALTH PROFESSIONALS

1. Sex Female _____ 2. Race White _____
 Male _____ Black _____
 Other _____

3. Education (List all current as well as past educational pursuits.)

Degree	School	Specialty or area of concentration	Yr. of Graduation

4. Occupation (List all past and current positions which are health care related.)

Position or Title	Institution or Organization	Employment Length	
		begin Mo/Yr	end Mo/Yr
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

Note: M.D.'s

Please list all hospitals at which you currently have admitting privileges.

1. _____
 2. _____
 3. _____
 4. _____

5. Professional Affiliations

* Attended more than half held.

Name of organization or group	Frequency of meetings	Do you attend meetings regularly*	
		Yes	No
1. _____			
2. _____			
3. _____			
4. _____			

6. On the average, how many patients do you come in contact with daily in a hospital setting?

_____ 0. (none) _____ 2. (11-20) _____ 4. (over 30)
 _____ 1. (1-10) _____ 3. (21-30)

Note: M.D.'s

Do you have a practice outside of a hospital? Yes _____ No _____

If yes, is this practice a single practice or a group practice?

Group _____ Single _____

If it is a group practice, how many other physicians are involved?

What, if any, are their specialties?

Note: M.D.'s

On the average, how many patients do you come in contact with daily outside of a hospital setting?

_____ 0. (none) _____ 2. (11-20) _____ 4. (over 30)
 _____ 1. (1-10) _____ 3. (21-30)

7. How often do you use each of the following resources as an aid in making patient care or related decisions?

	Daily	Weekly	Monthly	Yearly	Never
M.D. Specialist					
M.D. Generalist					
Nurse					
Pharmacist					
Technician					
Hospital Administration					
Reference books eg. PDR					
Professional Journals					
Other texts or written information					
Other (specify)					
Other (specify)					

8. Overall, rate each of the following resources according to how useful you perceive each resource to be: (circle one)

	Very useful			Not at all useful			Not applicable
M.D. Specialist	5	4	3	2	1		X
M.D. Generalist	5	4	3	2	1		X
Nurse	5	4	3	2	1		X
Pharmacist	5	4	3	2	1		X
Technician	5	4	3	2	1		X
Hospital Administration	5	4	3	2	1		X
Reference Materials eg. PDR	5	4	3	2	1		X
Professional Journals	5	4	3	2	1		X
Other texts or written information	5	4	3	2	1		X
Other (specify)	5	4	3	2	1		X
Other (specify)	5	4	3	2	1		X

9. How often, after consulting your resources, do you feel a need for additional information or consultation not immediately available to you?

Very often	Often	Sometimes	Seldom	Never
1	2	3	4	5

10. What would you like to see done to provide you and other health care professionals with better resources to help you make better patient care choices?

11. How many Continuing Medical Education hours did you accumulate

in 1978 _____ in 1979 _____

We intend to use this information as a base to evaluate the Telecommunications Information Network. We will compare this information with similar information collected at a later date. To make this task easier we would appreciate it if you would provide us with your name and position so as to make the data analysis more efficient. Your name will not be associated with any public dissemination of data.

If you choose not to provide your name, please complete the survey and return it without your name. If you have any questions please contact Jack Kues at 872-5545. Thank you for your cooperation.

Name _____

Position _____

Please return to the Telecommunications Information Network facilitator at your hospital.

Ruth Hoffman	Brown County General Hospital
Mary Espelage	Clermont County Hospital
Robert Rettig	Bethesda North Hospital
Frances McCullough	Mercy Hospital

Or send to:

Jack Kues
Medical Center Libraries
University of Cincinnati Medical Center
231 Bethesda Avenue
Cincinnati, OH 45267

IV. RESULTS

A. INTRODUCTION

The first year of this project has met with many successes, failures, and unanticipated outcomes. During Year 01, this project was charged with the development and evaluation of an on-demand information network. A time-line for accomplishing project goals was proposed in the original application (See Appendix C); the activity time-line for Year 01 (Figure 4) illustrates the close adherence to this schedule. Delays in the delivery of slow-scan equipment and installation of telephone company hardware postponed the technological completion of the Telecommunications Information Network. This delay is reflected in the small amount of data available for evaluating the use of the network. The limited use of the Telecommunications Information Network in Year 01 of this project should not be construed as indicative of the efficacy of the system.

Figure 4

Activity Time Line

Month

Year 01

1

Issue purchase orders for equipment.
Search process begins for project staff
- Search committee selects John R. Kues as Project Director
- Project Director begins January 22, 1979.
Appearance of articles on grant award in local newspapers.
Contacts with Cincinnati Bell to install necessary lines for three-way conference calling & data transmission.
Discussions with technical consultant concerning installation of equipment.

2

Search committee for Project Librarian selects Melanie McGuire; she begins February 19, 1979.
Meetings with Area Health Education Center (HEALTH-U.C.) staff to coordinate efforts on project implementation.
Initial meeting with hospital administrators at the four sites.
Development and meeting of Public Relations Committee for the project.
Continue discussions with technical consultant.

3

Project Review Committee formed.
Project announced in newspaper articles in communities involved.
Site visits to four hospitals.
Selection of facilitators at site hospitals.
Partial delivery of equipment.
Partial installation of phone equipment at U.C. Medical Center.
Negotiating with Cincinnati Bell for installation of data transmission equipment at three of the hospitals.

Month

Year 01

- 4 Meeting of Project Review Committee.
Delivery of equipment.
Return and repair of equipment.
Development and taking of a survey to complete profile of health care professionals at hospital sites.
Public relations campaign begins.
Site visits continue.
- 5 General reception and demonstration at the Health Sciences Library for Medical Center personnel, site hospital personnel and interested public.
Equipment delivered to hospitals.
Phones installed at Mercy, Bethesda North, and Clermont County Hospitals.
Negotiation with General Telephone for phone installation at Brown County General Hospital.
Final installation of phones at the Medical Center.
Working with technical consultants to complete tie-in of the Drug and Poison Information Center camera to equipment in the Health Sciences Library.
Distribution of newsletter, "Scanner #1."
- 6 Cyra Sanborn begins as assistant to the project on May 7, 1979.
System operational at the Health Sciences Library.
System being demonstrated at remote sites.
Slide/tape presentation produced for PR campaign.
Distribution of second edition of newsletter, "Scanner."
Distribution of background surveys to health care professionals at sites.
Data collection forms developed.
Continue site visits.
Continue negotiations with General Telephone.
Continue working with technical consultant.
- 7 Project Review Committee meeting.
Phone and equipment repaired at Mercy Hospital.
Additional video compressor purchases for the Drug and Poison Information Center.
Drug and Poison Information Center operational.
Health Sciences Library and the Drug and Poison Information Center staff begin responding to requests.
Continue PR campaign.
Continue site visits.
Continue negotiating with General Telephone.
Facilitator changes at Clermont County Hospital.
- 8 Phone installed at Brown County General Hospital.
Changes in facilitators at Brown County General Hospital.
Distribution of third edition of newsletter.
Continue all service, publicity, and data gathering efforts.
Continue visiting all four sites.
Data collection begins for TIN requests.

Month

Year 01

- 9 Phone equipment repaired at Clermont County Hospital.
Review of PR strategies.
All service activities and site visits continue.
Review project efforts to date and plan Year 02 of project.
- 10 - 12 Review status of research protocol.
Establish publications group to begin professional dissemination of project results to date.
Work with phone companies, technical consultant, and installation of additional phone equipment and second monitor location.
All service activities and site visits continue.
Completion and submission of proposal for Year 02.
Begin writing annual report for Year 01.

B. QUANTITATIVE DATA ANALYSIS

The Telecommunications Information Network completed mechanical connections throughout July and August of 1979. During this period, requests were taken from the health-care providers at the site hospitals. None of these requests were recorded as this period was designated for testing of the system. Data collection began August 20, 1979. From that time until the end of December, 1979, 59 requests for information were received at the Health Sciences Library and 61 requests at the Drug and Poison Information Center. The 120 requests were received over a period of 91 working days, averaging 1.3 requests per day. Table 1 shows the breakdown of requests by hospital and month. After a slow start in August and September, requests have significantly increased and averaged 1.5 requests per day for October, November, and December, 1979.

This distribution by hospital shows that the greatest number of requests (45.1%) was from Mercy Hospital. The other hospitals (Bethesda North - 21.6%; Brown County - 15.7%; Clermont County - 17.6%) average significantly fewer requests.¹ One of the objectives of this evaluation is to identify exactly who used the Telecommunications Information Network. Table 2 shows the types of users and the frequency with which they use the system. Physicians are the heaviest users of the system, making almost half of the requests. However, the wide variety of user types suggests that virtually all health-care providers at the four sites have health-care related questions that are unanswerable with the resources available to them at their hospitals. The majority of these requests are not made personally, but rather through facilitators (84.7%) at the hospitals.²

¹ The majority of data analysis in this report is taken from a sample of 59 cases. Because of the experimentation with the data collection instrument itself, only 59 cases were able to meet the requirements for these analyses. The remaining data were either incomplete or had questionable validity. The researchers feel, however, that the 59 cases comprise a representative sample of requests made through the Telecommunications Information Network.

² At the beginning of this project, contact individuals at each hospital were established. These contacts, or facilitators, were trained by the project staff in the use of the equipment and became the principal contact person at (continued on the next page)

Table 1

TELECOMMUNICATIONS INFORMATION NETWORK
REQUESTS FOR 1979

Hospital Site	September (19 working days)			October (23 working days)			November (20 working days)		
	MCL ₁	DPIC ₂	Total	MCL	DPIC	Total	MCL	DPIC	Total
Bethesda North	1	2	3	9	1	10	4	2	6
Brown County	1	2	3	3	2	5	0	2	2
Clermont County	1	2	3	4	1	5	6	3	9
Mercy Hospital	5	6	11	7	15	22	4	5	9
Total	8	12	20	23	19	42	14	12	26

Hospital Site	December (19 working days)			August 20-31 (10 working days)			Total
	MCL	DPIC	Total	MCL	DPIC	Total	
Bethesda North	3	2	5	0	1	1	25
Brown County	3	3	6	2	1	3	20
Clermont County	0	3	3	0	1	1	21
Mercy Hospital	5	4	9	0	3	3	54
Total	11	12	13	2	6	8	120

¹ MCL - Medical Center Libraries

² DPIC - Drug and Poison Information Center

² (continued from previous page) the hospital for individuals wanting to make a request through TIN. These facilitators were usually working at the primary site of the Telecommunications equipment i.e. librarians at Mercy Hospital and Bethesda North, a pharmacist at Clermont County Hospital, and the Education Coordinator at Brown County General Hospital.

Table 2

TYPES OF TIN USERS

<u>User Type</u>	<u>n</u>	<u>%</u>
Physician	26	44.8
Administrator	4	6.9
Nurse	4	6.9
Pharmacist	1	1.7*
In-Service Director	4	6.9
Physical Therapist	2	3.4
Resp. Therapist	2	3.4
Librarian	2	3.4
Nursing Supervisor	4	6.9
Other	9	15.5
Total	58	100.0

* Pharmacist uses of the network are underrepresented by this sample. Nearly 75% of the unused data are requests made by pharmacist. The actual amount of use by pharmacists is calculated to be approximately 35%.

Table 3

PRIMARY USE OF
INFORMATION REQUESTED THROUGH TIN

	<u>n</u>	<u>%</u>
Patient Treatment	19	42.2
Administration	3	6.7
Personal Knowledge	7	15.6
Teaching	8	17.8
Research	1	2.2
Other	7	15.6
Total	45	100.00

The primary use of the information requested provides insights into the information needs of the health-care professionals at the hospitals. Table 3 lists the primary uses of the information requested and illustrates the primacy of information related to patient treatment. It also points to an emphasis on information for teaching purposes, suggesting heavier education component at these hospitals than originally anticipated.

Of the 59 requests in this sample, 24 (over 40%) were answered using slow-scan television. The remaining 35 requests were answered either via telephone or through the use of an interlibrary loan or a computerized bibliography search. Interlibrary loan and computer responses were mailed to the requestor. Table 4 breaks down those requests where slow-scan was not used to respond to the question and details other response modes used for those requests. Since the interlibrary loan network between the four site hospitals and the Medical Center Libraries existed before this project as a means of requesting specific types of information or journal articles and books, interlibrary loan request

rates at these four hospitals are examined over a two year period to determine if the Telecommunications Information Network had an effect on lending rates.

Table 5 shows that, in general, lending patterns have not significantly changed. The exception is Clermont County Hospital which increased from zero requests in the 1978-79 period to 10 requests in the 1979-80 period. (It should be noted that all these requests were made between October and December of 1979.)

The apparent increase in interlibrary loan requests by Bethesda North Hospital can actually be explained by a change in procedure by the Bethesda Hospitals. In the 1978-79 period, all interlibrary loan requests went through the Bethesda Base Hospital, resulting in zero requests from Bethesda North Hospital. In May, 1979, Bethesda North Hospital began processing its own interlibrary loan requests, resulting in the apparent increase.

The drop in interlibrary loan requests at Brown County Hospital can be explained primarily by administrative policy regarding interlibrary loans at that hospital. During the 1979-80 period, they were made from September to December 1979 with zero requests being made in the first three-quarters of that year.

Table 4

TIN REQUESTS WHERE SLOW-SCAN WAS NOT USED

	Additional Services Requested ¹	Equipment Problems	Receiving Site had reference	Answer Given over phone	Nothing ² to send
Bethesda North Hospital	6	0	0	3	4
Brown County General Hospital	0	4	0	0	0
Clermont County Hospital	5	0	0	0	0
Mercy Hospital North	1	0	2	6	2

¹ Additional services include on-line computer searches or interlibrary loan requests. In cases where entire articles are requested, an interlibrary loan request is automatically assumed since to transmit an entire article via slow-scan would violate Medical Center Library policy.

² In cases where there was no information to send, there may not have been any available on that request or further information was needed before the request could be answered.

Table 5

INTERLIBRARY LOAN STATISTICS FOR SITE HOSPITALS

Hospital	April '78-March '79 (Total Num/Ave. Num. per month)	April '79-Jan. '80
Brown County	23/1.9	13/1.3
Clermonty County	0/0	10/1.0
Bethesda North	0/0	48/4.8
Mercy North	55/4.5	47/4.7

Table 6

RESOURCES USED FOR TIN REQUESTS*

<u>Resources</u>	<u>N</u>	<u>h</u>
Book	47	39.2
Journal	52	43.3
Human	14	11.7
Other	7	5.8
Total	120	100.0

* Data based on 57 requests.

A variety of resources were used by the Telecommunications Information Network staff in responding to requests. Table 6 shows that while the majority of the resources were books and journals, content specialists made up a significant part of the resource pool. The human resources include members of the Medical Center departments, hospital staff, drug company representatives, and state and federal agencies. An average of 2.1 resources were used to answer each request. Because of the number of resources used in each request and the types of questions being asked, the actual research time per request averaged slightly over one hour. This period includes only the actual time spent researching the request. The actual turn around time for each request (the time the request was made until a response was given) averaged 17.5 hours. This time period was reflected in the types of questions being submitted to the Telecommunications Information Network at the Telecommunications Office at the Health Sciences Library. Typical questions were:

- "causes and preventative measures of arrhythmias after chest trauma"
- "what are the adverse or positive effects of jogging or running on arthritis of the knee"
- "what is the efficacy of treating post-lamectomy with epidural injections"
- "criteria for release of a patient from intensive care"
- "written guidelines for procedures for patients with viral or infectious hepatitis",

It is very difficult to respond quickly to questions such as these that require in-depth research. As each request is taken, the requestor is always asked how soon the information is needed. In cases where the information is needed immediately, all reference staff at the Health Sciences Library help research the question. Although there have only been two such questions in 1979, both of these questions were answered within one hour.

Two of the site hospitals, Brown County General Hospital and Mercy Hospital North are equipped with hard-copy printer units. These hospitals have the capability of making hard copies of transmitted information. This is particularly valuable in light of the fact that 84.7% of the requests were made through the facilitator and not directly by the information user. One of the objectives of this evaluation is to determine the effect of the hard-copy printer on the use of the Telecommunications Information Network. The hospitals with printers account for approximately 60% of all Telecommunications Information Network requests although the printers are used 100% of the time responses are made via slow-scan television. There is also no significant difference in the amount of slow-scan television use between hospitals with and without printers.

The search to find variable related to the use of the system requires a closer examination of the characteristics of the four hospitals. The heaviest user of the system is Mercy Hospital North. The facilitator of this hospital is a librarian; the equipment is located in the library which is in a separate building from the main hospital. The facilitator at Bethesda North Hospital is also a librarian; the equipment is located in the library which is located in the hospital. At Clermont County Hospital, the facilitator is a pharmacist; the equipment is located in the Pharmacy along the main hallway of the hospital. At Brown County, the facilitator is the Education Coordinator; the equipment is located in a room used for viewing various audio-visual resources which is also in a central area of the hospital.

The location of the equipment with respect to system users does not appear to be a factor in the system's use, since the hospital where the equipment is farthest from the users also has the highest use. Another possibility is that those hospitals with established libraries are going to experience greater use of the network because information-seeking behavior of hospital staff has already been established. Two hospitals with well-established libraries are Mercy Hospital and Bethesda North Hospital. Clermont County Hospital does not have a library of any kind and Brown County General Hospital has an extremely outdated collection. The hospitals with well-developed libraries account for over 65% of all Telecommunications Information Network questions. These hospitals, however, make up only 50% of the requests which used slow-scan television in the response.

The third most plausible explanation for differential use of the Telecommunications Information Network is the size of the hospital. The hypothesis is that the larger the hospital, the more requests are sent through the network. It proved very difficult, however, to identify exact numbers of health-care providers at each hospital. The 1979 edition of the AHA Guide to the Health-Care Field provided the following statistics:

Bethesda North Hospital	234 beds	572 personnel
Brown County General	132 beds	207 personnel
Mercy Hospital North	300 beds	832 personnel
Clermont County Hospital	63 beds	225 personnel

The number of personnel, however, does not include interns, residents, or other non-paid health-care providers. Bethesda North Hospital and Mercy Hospital North are each part of two hospital complexes which share medical and dental staff, and therefore it is particularly difficult to identify

staff associated with a single hospital location. With the knowledge that these statistics may not be totally accurate, it still appears that the hypothesis is supported. There is a perfect correlation between the number of personnel as stated in the AHA Guide to the Health Care Field and the number of requests, received from each hospital.

C. QUALITATIVE DATA ANALYSIS

There are several objectives of this project that do not lend themselves to quantitative analysis. These include the establishment of an information network, the development of a marketing strategy, and the establishment of a Project Review Council.

1. Establishment of the Telecommunications Information Network

The establishment of the Telecommunications Information Network involved planning the network, the purchase of the equipment, and the installation and testing of this equipment at each of the four site hospitals and within the U.C. Medical Center.

Much of the work involved in planning the Telecommunications Information Network was completed before the funding of the project. Experience from a prior research project funded by the National Library of Medicine (LM - 02350) indicated that a visual technology like slow-scan television is appropriate for connecting distant sites. The most appropriate equipment was chosen and purchased after funding began.

As part of the proposal for Year 01 of this project, consultation was begun with each of the remote hospitals to determine the most appropriate location for the slow-scan equipment. Discussions concerning monitor locations continued through the first several months of the funding period due to physical improvements and other changes at the site hospitals.

Since voice-grade telephone lines are used to transmit the slow-scan video signal, it was necessary to interface the Telecommunications Information Network equipment with the Cincinnati Bell Telephone Company and the General Telephone Company of Southwest Ohio. Difficulties regarding this interface arose from inexperience with the new technology. Misunderstanding concerning installation and repair of telephone equipment delayed the completion of the Telecommunications Information Network.

The installation of slow-scan equipment was completed at the primary monitor location in three site hospitals in June, 1979, and the fourth site hospital was operational by mid-August, 1979. Secondary monitor locations are scheduled for January, 1980, pending the necessary electrical connections.

With the system operational, either of the two sites at the U.C. Medical Center can transmit information to a monitor location at each of the four site hospitals. The hospital library is the primary receiving site at Brown County General Hospital, Bethesda Hospital North, and Mercy Hospital North. The primary receiving site at Clermont County Hospital is the Pharmacy. The secondary receiving sites will be the Emergency Rooms at Brown County General Hospital, Bethesda Hospital North, and Clermont County Hospital and the Pharmacy at Mercy Hospital North. Brown County General Hospital and Mercy Hospital North each have a hard-copy printer unit at their primary receiving site.

2. Establishment of a Human Resource Network

With the creation of the Telecommunications Information Network, a network of people was established to complement the technological network. This human resource network, coordinated by the staff of the Telecommunications Information Network, includes the staffs of the Medical Center Libraries; the Drug and Poison Information Center; the medical staff and faculty at the U.C. Medical Center; and project administrators and facilitators at each of the four site hospitals.

There are two major aspects to this network: (1) the network of resources within the U.C. Medical Center and (2) the network between the Medical Center and hospital facilitators. This human network has proved to be very important in Year 01 of the project. The network between the Medical Center and the facilitators at the site hospitals is the pivotal connection between these two institutional groups. The Telecommunications Information Network staff, the Drug and Poison Information Center staff, and facilitators work together in their public relations efforts at the hospital sites. The facilitators act as an on-site information source regarding the Telecommunications Information Network. The facilitators also frequently act as intermediaries by relaying questions from other health professionals. The facilitators at Mercy Hospital North and Bethesda Hospital North are also the hospital librarians and are, therefore, already involved in assisting health-care providers locate information. The Education Coordinator is in a similar position as facilitator at Brown County General Hospital. A pharmacist at Clermont County Hospital is the facilitator at that location.

3. Establishment of a Marketing Strategy for the Telecommunications Information Network

Lack of awareness of the system and the fear of something new and technological are major obstacles the Telecommunications Information Network must overcome. The marketing strategy for the Telecommunications Information Network is one of the most important aspects of the network. The public relations committee was one of the first Telecommunications Information Network committees formed; it addressed its efforts to three audiences: the four site hospitals, the U.C. Medical Center, and the general public.

Upon verification of funding of Year 01 of this project, press releases were distributed to the local newspapers. Articles appeared in Cincinnati newspapers as well as in local newspapers at the site hospital locations. The public relations committee developed a project logo to identify the Telecommunications Information Network (Figure 5) and large information posters to be distributed at each hospital had the name of that hospital's facilitator and the location of the Telecommunications Information Network equipment. A newsletter describing the activities is published by the public relations committee approximately every six weeks (See Appendix D.)

A general reception and demonstration was held for the inauguration of the Telecommunications Information Network on May 3, 1979. Invitations were sent to over 100 representatives of the University of Cincinnati, the four site hospitals, and other interested parties. Two local radio stations aired an interview with the Project Director in association with the initiation of the Telecommunications Information Network.

A fifteen-minute slide-tape program was produced by the Telecommunications Information Network staff for use at on-site demonstrations and

general information purposes. This program has received wide use as part of various in-service programs and medical staff presentations at the four sites.

A general information pamphlet was developed for distribution at both the U.C. Medical Center and the site hospitals (See Appendix E). Table 7 presents a concise list of the major marketing efforts, to date, as well as the audience towards which each is aimed.

Table 7

MARKETING EFFORTS FOR THE
TELECOMMUNICATIONS INFORMATION NETWORK

Item	Target Audience *		
	Site Hospitals	U.C. Medical Center	General Public
Newspaper articles			X
Radio interview			X
Information posters	X	X	
Newsletter ("Scanner")	X	X	
General Reception	X	X	
On-site demonstrations	X		
Slide-tape program	X	X	
In-service programs	X		
Preentation to Medical Staff	X		
Information pamphlet	X	X	
Professional newsletters and journals			X

* An (X) denotes item was directed at this audience group.

4. Establishment of a Project Review Council

The Project Review Council acts as the coordinating body between the U.C. Medical Center and the four hospitals involved with the project and is chaired by the principal investigator of the project. The Council is primarily responsible for policy-making and strategic planning regarding slow-scan telecommunications and the transmission of information from the U.C. Medical Center to areas within Southwest Ohio using this technology. The Council is composed of representatives from organizations and professions involved with the network -- the four hospital sites; the Medical Center Libraries; the Drug and Poison Information Center; HEALTH-U.C., hospital administration and staff as user groups; research; librarianship; technology; and residents/faculty of the U.C. Medical Center.

The Project Review Council is in the process of developing policies related to the Telecommunications Information Network. Several policies have been written and approved (See Appendix F). Subsequent meetings will address the issues of additional policies and the future of the Telecommunications Information Network.

Telecommunications Information Network Logo

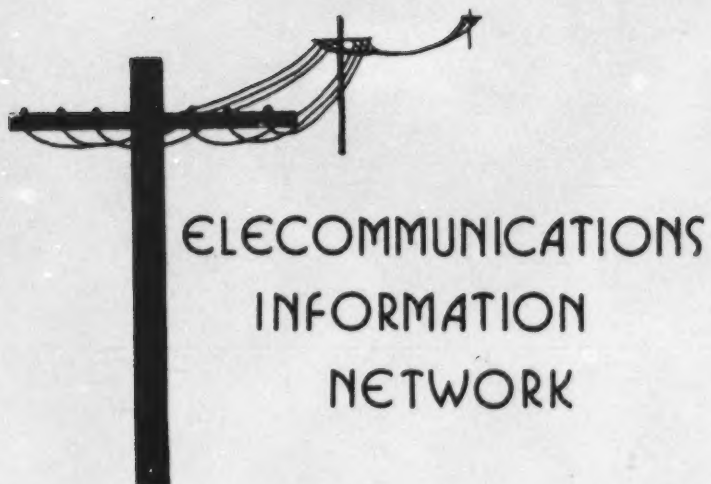


Figure 5

FAST INFORMATION IS ONLY A SLOW SCAN AWAY!



Medical Center Libraries
and
Drug and Poison
Information Center



**The University of Cincinnati
Medical Center Libraries can put
you in touch with:**

- current medical information**
- drug information**
- consultants in specialty fields**

(Hospital facilitator)

(Location of Telecommunications
Information Network equipment)

(Actual size of poster: 22" x 17")

FIGURE 6

**A grant project funded by the Office of Telecommunications,
Department of Health, Education, & Welfare.**

D. UNANTICIPATED OUTCOMES

In addition to the planned outcomes of this project, there are a number of results, both positive and negative, which were unanticipated. These will be documented and analyzed in this section of the report. Many of these unanticipated outcomes, notably those associated with slow-scan technology, became an integral part of the first year of this project and will be pursued in Year 02.

1. Establishment of Closer Links Between the Four Site Hospitals and the U.C. Medical Center

One of the purposes for establishing the Telecommunications Information Network is to reduce the isolation felt by rural health-care providers. In addition to providing information via slow-scan television, the Telecommunications Information Network has established other links between the site hospitals and the U.C. Medical Center. In the first nine months of this project, the Telecommunications Information Network staff logged over 2,200 miles for site visits to four hospitals.

Each hospital is visited at least once a month. On these visits, Telecommunications Information Network staff members talk with the facilitators, physicians, nurses, hospital administrators, librarians, and other users and potential users of the system. Individuals at the site hospitals are encouraged to visit the Telecommunications Office at the U.C. Medical Center. Each site hospital has a representative on the Project Review Council which meets on an as-needed basis at the Medical Center. All four hospitals also have medical staff who are part-time faculty at the U.C. College of Medicine. By using faculty members as an information resource, the Telecommunications Information Network project is strengthening the connections between the four site hospitals and the U.C. Medical Center.

The staff of the Drug and Poison Information Center has prepared a document describing the drug information resources (print and human) in the system and has used this document in meetings at the four hospitals. The Drug and Poison Information Center offers training for pharmacy residents, pharmacists, and pharmacy students in the techniques of providing drug information. A special program is in effect to train such persons already at work in the four hospitals and encourage the use of the Telecommunications Information Network.

2. Establishment of Links with Other Networks and Institutions

In addition to closer links between the four site hospitals and the U.C. Medical Center, the Telecommunications Information Network has established links with other institutions. Members of the Telecommunications Information Network staff are working closely with the staff of the Area Health Education Center (AHEC) known as the Health Education Alliance through the University of Cincinnati (HEALTH-U.C.). HEALTH-U.C. is responsible for responding to the health manpower needs in underserved areas of the eight counties of Southwest Ohio. Since all four site hospitals are in this eight-county area, we are coordinating the efforts of the Telecommunications Information Network with those of HEALTH-U.C.

The staff of the Telecommunications Information Network is also working with the Office of Continuing Medical Education (CONMED) at the U.C. College of Medicine. This association has two goals: (1) to study the potential of slow-scan television as a mode of delivery for Continuing Medical Education (CME) programs and (2) to share data on the physicians affiliated with the four hospitals involved with the Telecommunications Information Network.

The Telecommunications Information Network Project Director has made contacts with the directors of other slow-scan television information needs. Initial contacts have been made with the Lister Hill Center (a division of the National Library of Medicine) and projects coordinated through the Boulder Laboratories Library (TALINET). These contacts are expanding our understanding of the technology and will possibly expand information resources available to the Telecommunications Information Network.

3. Exploration of Expanded Potential of Slow-Scan Technology

One of the advantages of working with a new technology is that it can be molded to individual needs. In efforts to speed up the transmission of several images sequentially over the Telecommunications Information Network, a pre-recorded transmission capability was explored. Slow-scan signals can be recorded on a high quality audio recorder. The wide range of uses of this recording technique include:

- o Recording of demonstration tape containing transmissions of several different types of media including X-rays, slides, printed materials, and three-dimensional models. This demonstration tape is played to site hospitals to encourage the use of the Telecommunications Information Network among health-care providers.
- o Pre-recording of lengthy responses to requests for medical information.
- o Development of short information programs regarding new resources available at the Medical Center to health-care providers at the site hospitals.
- o Experimentation with the development of continuing medical education programs by re-formatting existing programs presently in slide-tape form.

The use of the tape recorder in conjunction with slow-scan television greatly expands the potential of the Telecommunications Information Network. Programs may be specifically developed for use with slow-scan technology adapted from other formats. This expands the system to cover not only on-demand questions, but also some general information-seeking by the health-care providers at the sites.

4. Delays in the Link-Up of Slow-Scan Equipment Between the Site Hospitals and the Medical Center

The greatest difficulty encountered by the project staff in Year 01 involved the establishment of the slow-scan network. These problems arose from several different areas. The first was the implementation of the proposed network model. Each hospital was scheduled to have a single video expander and two video monitors located in different parts of the hospital.

The immediate problem with this model involves control of the video expander and communications links between monitor sites and the Medical Center. The video expander, then, must be operable from a remote monitor site. This remote site must also have the capability of establishing the phone link between the video compressor at the Medical Center and the video expander at the receiving hospital. The project staff was confronted with several specific problems: (1) Site hospital personnel must construct a video, coaxial cable link between the video expander and the second monitor site. (2) The capability must be developed to complete a phone link between the video compressor at the Medical Center and the video expander at the site hospital in the absence of an individual at the video expander site. An alternative to this is to have the ability for an individual at the remote monitor site to complete the phone link-up between the video compressor and the video expander. (3) The capability must exist for an individual at the second monitor site to activate the video expander.

Similar difficulties with the model existed at the Medical Center. The original model called for a single compressor and the ability to activate that compressor from two different sites within the Medical Center. A second camera site, then, had to have the capability of remotely activating the video compressor. This particular difficulty was finally solved by installing a second video compressor.

The problems at the hospital sites, however, were more difficult to solve, principally because of the cost of purchasing additional video expanders. The problems were temporarily postponed when it was decided to install the system with a single monitor site. Although, the problems involving remote monitor sites were eventually solved with auto-answer couplers and remote control switches, this problem-solving process was very time-consuming and delayed the full implementation of the Telecommunications Information Network. It also made several aspects of the evaluation impossible because remote monitor sites did not exist in Year 01 of this project.

Since slow-scan technology uses voice-grade phone lines to make connections between sites, an interface was necessary between slow-scan equipment and telephone company equipment. The two phone companies involved in this interface (Cincinnati Bell and General Bell) had no previous experience with slow-scan technology. Repeated installations and repairs were necessary before the desired interface was completed.

Once the network was completed, two more limitations of the technology became apparent. The first involved the amount of printed information that could be sent in a single slow-scan transmission. It was anticipated that entire journal and book pages could be sent in one transmission, however, after some experimentation it was discovered that in order to produce a readable image, the print had to be unusually large. The maximum amount of information which could be transmitted successfully was approximately 3 to 4 paragraphs or one quarter of a page. This varied with print size. This required many more slow-scan transmissions per request and proved to be bothersome to both the requestor and proved to be bothersome to both the requestor and the project staff.

The second problem involved the quality of the copies produced by the hard-copy printer. The printer produces heat-developed copies of the composite video signals. The heat-developing requires the printer to be warmed-up for a period of at least 10 minutes before use. This presents difficulties because the equipment is generally left turned-off until needed and it is often impossible to determine the exact time a response will be slow-scanned to a hospital site. The quality of the copies are generally poor. Often two or three copies of the same picture must be made to produce one that is readable.

V. DISCUSSION OF RESULTS

A. OVERVIEW

As stated earlier, the over-all evaluation of this project is severely hampered by the limited amount of data available for analysis. The network itself has been operational for only four months and any in-depth evaluation at this point would be premature. This evaluation, however, illustrates problems in the development of such a network, and is, therefore, beneficial to those contemplating something similar. The Telecommunications Information Network has some notable dissimilarities to the way in which it was originally proposed. These dissimilarities are both enlightening and cause for further analysis. Most of these alterations were the result of problems encountered with portions of the original proposal. As discussed throughout this report, many of these problems have been solved while others still exist. The results of this project to-date have yielded important insights into telecommunications, information transfer, health-care institutions and medical professionals.

B. ALTERNATIVE EXPLANATIONS

In the proposal for this project, there were no goals laid out for the amount of use this network should receive; however, it is still felt that the Telecommunications Information Network is underutilized. At its present rate, the network is receiving approximately 1.3 questions per day which is slightly over one question per week per hospital. There is no way to tell whether this present usage rate is going to increase, decrease, or remain stable. There are, however, several possible scenarios for present usage rates. Health-care providers must make medical decisions every day. Medical science is also undergoing changes in treatments and protocols on an almost daily basis. Based on these facts, it seems unlikely that the number of requests accurately reflects the actual number of questions in the target population. An individual with a question weighs the need to know against the costs, both in time and effort, in finding an answer. Some methods of seeking information, such as asking a colleague, require very little effort and represent a very attractive means of information seeking; other methods of seeking information such as library research require large amounts of time and effort and are correspondingly unattractive. When the need-to-know occurs, an individual seeks answers beginning with the easiest and most available sources, i.e. colleagues, and continues on to the more time-consuming resources until the question is answered or the consequences of not knowing are less than the costs of seeking the information. Because of the anticipated time and energy involved, the Telecommunications Information Network is probably perceived as a less attractive means of finding information.

The type of question that is likely to be put to the Telecommunications Information Network is one that is perceived as important, and the information was not available from other resources. The question is likely to be complicated, requiring a number of library resources, and not needing an immediate response. Most of the requests made through the Telecommunications Information Network fit this profile. The network was originally set up to handle the quicker, less time-consuming question; however, most questions of this type were probably answered through other available resources at each hospital site. This does not nullify the work of this network; rather, it identifies a different kind of need than was anticipated.

In view of the changes in the type of requests being submitted to the network, questions should be raised about the methodology used to provide the information. It is clear, from the preliminary evaluation, that slow-scan is one viable alternative; however, because of the in-depth questions being asked and their non-emergent status, the speed of the medium becomes less crucial. One alternative method, which some of the requestors have used, is the interlibrary loan system in which entire citations are photocopied and sent through the mail. Since there seems to be heavy used of the printers at the hospitals that have them, a sophisticated tele-facsimile network may be appropriate. This type of network provides the speed of slow-scan with the ability to produce hard-copy prints, such as interlibrary loan. Questions regarding the methodology should be answered by future research projects as they are not part of this evaluation.

VI CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The principal conclusion from this evaluation is that telecommunications is a viable method for linking remote health-care sites to a major medical center. As a result of this network, health-care providers at the four site hospitals have used the resources of the University of Cincinnati Medical Center. The use of facilitators at each of the site hospitals has stimulated network use since most questions are filtered through the on-site facilitator. Although the heaviest users of the network are physicians, a wide range of hospital employees have also made requests through the system. Although there is a heavy use of hard-copy printers, the existence of a printer does not appear to affect use of the system. For the hospital with no previous interlibrary loan requests from the Medical Center, the network appears to have stimulated the number of interlibrary loan requests. It has not affected the other hospitals who have all had previous interlibrary loan experience. The requests received through the Telecommunications Information Network are both fewer and more research-oriented than originally anticipated and have the effect of making the network much less of an on-demand system. It is difficult to draw further conclusions as the network has been in operation for a very short period.

B. RECOMMENDATIONS REGARDING THE PROGRAM

The major recommendations regarding the continuation of the Telecommunications Information Network are focused on its cost-effectiveness. A cost study which was proposed for Year 01 could not be completed due to the late start of the project and the small amount of data collected. During the first four months of the network's operation, the slow-scan television system was used on an average of less than half an hour a day. This leaves a significant period of time that the slow-scan television network could be utilized. To develop an expanded use of this network and to test its cost-effectiveness for a number of different purposes, two new goals have been proposed for study in Year 02.

Goal 5: TO STUDY THE FEASIBILITY OF CONNECTING THE TELECOMMUNICATIONS INFORMATION NETWORK WITH OTHER INFORMATION-BASED SYSTEMS.

Enabling Objectives

- a. To link the Telecommunications Information Network with two or more existing slow-scan networks.
- b. To study the feasibility of using existing slow-scan networks as a resource for the Telecommunications Information Network.
- c. To study the applications of added resources through expanded networks for the Telecommunications Information Network.
- d. To study the advantages and disadvantages of Mega-Networking.

Discussion

There are several information networks in the country today which are using slow-scan television or similar technologies as a means for information transfer. One of the accomplishments in Year 01 of this project is that some of the networks were identified and initial contacts were made. The goal for Year 02 is to strengthen these contacts and study the feasibility of connecting the Telecommunications Information Network with these other networks.

This process will begin by determining the compatibility of slow-scan television used in the Telecommunications Information Network with similar equipment used in other networks. With the cooperation of other networks, tests for equipment compatibility will occur. Also, site visits will be arranged with other project coordinators (particular interest will be given to the TELINET system in Boulder, Colorado, and the Lister Hill Center in Bethesda, Maryland, where initial contacts have been made.)

A list of available resources will be exchanged with the other networks and an evaluation of the mutual benefit of resource sharing through telecommunications will be conducted by the Telecommunications Information Network Project Librarian in conjunction with staff members from the other networks. In addition to this evaluation, policies will be developed to define the guidelines of inter-network resource sharing.

Data on the use of resources from other networks for Telecommunications Information Network requests will be collected for each request. An additional instrument will be developed to collect data on the use of U.C. Medical Center resources by other networks.

The experiences of the Telecommunications Information Network staff in developing and using this proposed inter-network systems will be documented by the Project Director in a diary maintained on network activities. These experiences plus data collected during Year 02 will be used to access the advantages and disadvantages of such a network. These data will also be shared and discussed with staff members of all participating networks.

Goal 6: TO DETERMINE IF THE TELECOMMUNICATIONS INFORMATION NETWORK SHOULD REMAIN IN OPERATION, AND, IF SO, HOW IT CAN BECOME SELF-SUPPORTING.

Enabling Objectives

- a. To determine the cost-effectiveness for transmitting information via television through slow-scan to each of the remote receiving sites.
- b. Exploring at least one additional use of the Telecommunications Information Network.
- c. To conduct a micro-costing study of the Telecommunications Information Network.

Discussion

To determine if the Telecommunications Information Network is a cost-effective means of information transfer, a cost study will be conducted on the network to determine two things: (1) The costs of setting up a system, and

(2) the costs of a single use of the system. The system cost study is termed a macro-cost and the single use study is a micro-cost. For evaluation of a research project's applicability to non-research modes, the micro-costing provides more relevant data for the day-to-day operation of a telecommunications system.

Micro-costing is done by calculating the average cost of staff, resources, and administration involved with a single use of the Telecommunications Information Network. Staff members are timed over a sample percentage of their interactions with the system and costs of that time are calculated. A proportion of equipment depreciation and use of other resources is also included in the cost of each system use.

As usage of the Telecommunications Information Network increases, micro-costs decrease. To reduce costs and to include a larger market group to support the system costs, new applications for the system need to be explored. One possible addition to the uses of the system is on-demand continuing medical education. Using the capabilities of recording video images and audio track (e.g. slide-tape) programs on a stereo cassette, pre-packaged educational programs can be made available on-demand for playback over the slow-scan system. The cassette player leaves the Telecommunications Information Network's equipment free to transmit reference information, while increasing use of equipment at the receiving sites.

A pre-packaged system would reduce staff cost as it reduces the percent of "custom" answers provided by the system. The pre-packaged system responds to the need for time flexibility in continuing medical education. Such a system would increase the rate of information transfer, make continuing education programs available in rural and suburban areas, support the goals of the Area Health Education Center, and reduce operating costs of the Telecommunications Information Network. If the system becomes self-supporting, unit prices could be kept lower because of a broader, more active market.

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VIII. APPENDICES

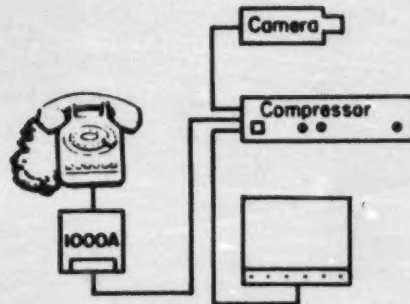
Appendix A

EQUIPMENT LIST FOR THE TELECOMMUNICATIONS INFORMATION NETWORK

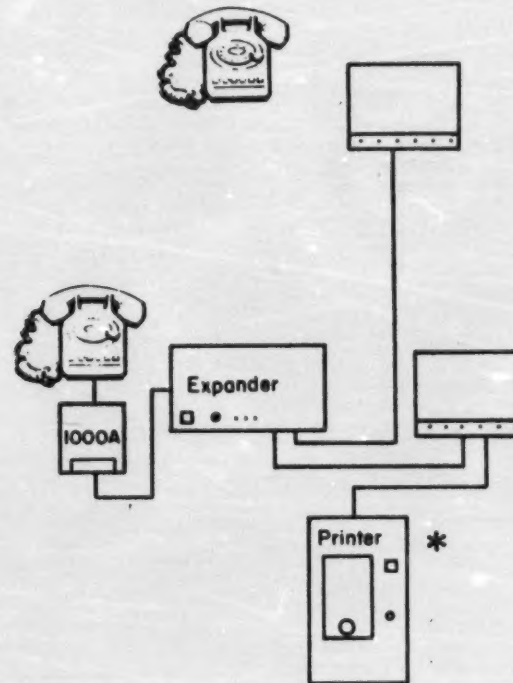
<u>Quantity</u>	<u>Item</u>	
(10)	GBC "17 Video Monitors	(Model MV17)
(2)	CVI Video Compressor	(Model 260B)
(4)	CVI Video Expander	(Model 275)
(2)	Teletronix Hard-Copy Printer	(Model 4632)
(2)	Diamond Vidicon Camera	(Model ST-3)
(2)	Canon Zoom Lens 25-100mm	(Model TV-16)
(1)	Sony Cassette Tape Recorder	(Model TC-142)

Telecommunications Information Network

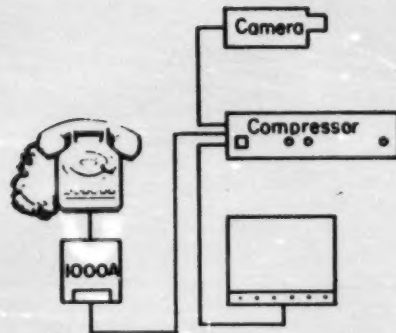
T.I.N. Office



Hospital



DPIC



* Located at Brown Co. and Mercy

APPENDIX B

Appendix C

Project Time Line

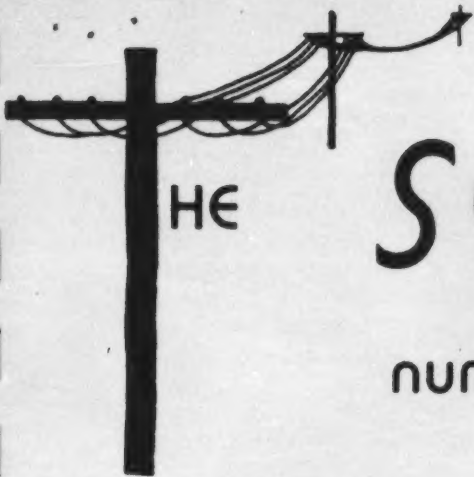
Month

Year 1

1	Issue purchase orders for equipment Begin Search process for project staff Announce grant support in local press (Cincinnati, plus other communities involved) Medical Center Libraries Extramural Staff will focus on this project at each project site Establish the Technical Review Council Update user profiles
2	Receive and install equipment at each project site Interview and hire project staff Project coordinator will begin Establish research protocols Library will begin to respond to information requests with existing staff Visit each location Meet with Project Review Council Collect data on forms developed Drug and Poison Information Center will begin to respond to requests Begin the base line study to determine current information needs at all sites Begin Public Relations campaign
3	Librarian will begin Librarian team member will begin to respond to information requests Establish facilitator groups at each site Hold monthly meeting of Project Review Council
4	Begin development of computer programs for ongoing data analysis Hold a facilitator meeting at each site Complete a base line survey to determine the present information seeking behavior pattern of people at each of the respective sites
5	Analyze data collected from the base line study Continue all service efforts
6	Review status of evaluation protocol. Determine if any corrections are necessary based on project experience Continue all service, publicity, and data gathering efforts Continue visiting all four sites monthly Continue Monthly Project Review Council's meeting Continue meeting with the site facilitators council
7 - 10	Same as month six

Month ,

- 11 Begin to evaluate the effort of the project to date
Draft report of project to date
All service activities and site visits continue
- 12 Complete report for Year 1 efforts for granting agency
- Year2
- 1 - 6 Continue all service functions, publicity, and data collection
Continue all Project Review Council meetings
Continue all Site Facilitators Council meetings
- 7 - 12 Continue all service functions, all Project Review Council
 and site facilitator meetings
Begin the evaluation outcome effort
Obtain output from computer
Formulate final report to granting agency
Begin to prepare information for journal articles



SCANNER

number: 1

date: May 1, 1979

The telecommunications grant, which was recently awarded to the University of Cincinnati Medical Center Libraries by the Office of Telecommunications, Department of Health, Education, and Welfare, is getting under way! This project will establish a slow-scan telecommunications system as an alternate means of transferring on-demand medical information from a major medical center to health professionals in four remote settings. It will also evaluate the acceptability and usefulness of this system to the health care professionals utilizing it.

Because it is not economically feasible to provide major information resources and information searching services in each semi-rural and suburban hospital, the most realistic approach is to make the existing resources of a larger well-equipped facility available to the practitioners there. Slow-scan technology can provide a practical means of linking centralized resources and the health professionals in outlying areas.

The four receiving site hospitals selected for participation are: Brown County General Hospital, Clermont County Hospital, Bethesda North Hospital, and Mercy Hospital in Hamilton. There will be two slow-scan television monitors at each of the sites (except Bethesda North, which elected to begin with only one due to the centralized location of the hospital library).

Television cameras and staff will be located in the Telecommunications Information Network (TIN) Office of the Health Sciences Library and in the Drug and Poison Information Center (DPIC) at the University of Cincinnati Medical Center. They will respond to specific information needs when the "need to know" arises. Individuals at any of the four sites will be able to call the TIN Office or DPIC for answers to specific questions. The questions will be researched and, if a visual component is needed, the necessary information will be transmitted via slow-scan television to a monitor at the site hospital.

Slow-scan television is television in which the video signal is compressed

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A grant project funded by the Office of Telecommunications,
Department of Health, Education, and Welfare*

872-5545

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to a band-width suitable for transmission over voice-grade telephone lines. At the receiving end the signal is expanded and viewed over a television monitor. Slow-scan is an inexpensive and efficient alternative to live video, which would require extensive construction and equipment costs necessary to transmit the more conventional television signal. Any still image -- microfiche, slides, X-rays, book or journal pages -- may be reproduced; transmission time takes approximately 75 seconds. Two of the four site hospitals (Brown County General and Mercy Hospital) will also have the capacity to receive hard-copy prints of the information over the same television system.

A conference-calling line will also be available in the TIN Office, thus enabling consultation with specialists at the U.C. Medical Center. If the information resources of the library are unable to satisfactorily answer a question, then a three-way conversation may be initiated between the requestor, the librarian, and a specialist.

The system is scheduled to be operational by mid-May and if the project is successful, there is the potential for expansion in many directions.

Each of the four receiving sites has selected a "facilitator" to help coordinate activities between the hospitals and the Medical Center and to help acquaint persons with the system. Facilitators and primary monitor locations will be:

Marcia Tomlin	Brown County General	Education Resource Center and HEALTH-U.C.
Michael Keeney	Clermont County Hospital	Pharmacy and Emergency Room
Thomas O'Conner	Bethesda North Hospital	North Medical Library
Frances McCullough	Mercy Hospital	Health Sciences Library

Jack Kues has been appointed as the Director for the Telecommunications Information Network. Jack received his B.S. degree in Psychology and Sociology in 1975 from Northern Kentucky University, his M.A. degree in Sociology in 1977 from the University of Cincinnati, and is presently completing work for his Ph.D. from the Department of Sociology at U.C.

Melanie McGuire has assumed the position of Librarian for the TIN project. Melanie received her A.B. degree in Biology in 1975 from Earlham College, Richmond, Indiana, and her M.S.L.S. degree in June, 1978, from the University of Kentucky College of Library Science.

If there are any questions concerning the TIN, please contact the facilitator at your hospital or call Jack or Melanie at the U.C. Health Sciences Library, 872-5545.



HE

SCANNER

number: 2

date: June 15, 1979

Telecommunications Information Network

The Telecommunications Information Network (TIN) is an experimental research project funded by the Department of Health, Education, and Welfare's Office of Telecommunications. TIN uses a slow-scan television to connect the Medical Center Libraries and the Drug and Poison Information Center to four outlying rural and semi-rural hospitals. The system is designed to provide on-demand information in response to specific medical questions from health-care providers at any of the sites affiliated with the project. The four Ohio hospitals involved with this project are: Mercy Hospital in Hamilton; Clermont County Hospital in Batavia; Bethesda North Hospital in Cincinnati; and Brown County General Hospital in Georgetown.

The primary focus of this grant is to research the utilization of TIN once it is in operation. Even though the technology for such a system has existed for several years, its potential applications are just beginning to be realized. The project is designed to study utilization rates and attitudes toward the use of the system. Comparisons will be made of different monitor locations within a hospital, different hospital sites, sites with and without hard-copy printers, and different types of usage by health-care professionals. Data will also be collected on the number of requests, the usage rates of slow-scan television and three-way conference calling, as well as the type of information requested. We hope that this research will give us insights into the "people side" of technology and will suggest some methods for improving exchange and dissemination of information in the health sciences.

Washington Conference

Jack Kues, Director of the Telecommunications Information Network, and Roger Verny, Head of the Media Resources Center at the Medical Center Libraries, recently attended a workshop on telecommunications in Washington D.C. Sponsored by HEW's Office of Telecommunications, the workshop was attended by others involved in federally-funded research projects as well as by Washington policy-makers who are interested in the future of telecommunications in the social service areas.

The workshop explored many different modes of telecommunications which are currently being tested. There was much interest and support for our TIN and it is very likely that we will be visited by representatives from HEW who want first-hand experience in seeing our system operate.

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Project Review Council

The Project Review Council is the coordinating body for the Telecommunications Information Network. The council will primarily be responsible for strategic planning regarding the project -- its direction and policy formation. Persons were chosen from the university and from each hospital site to represent different divisions of the research and health-care fields. They are:

Nancy Lorenzi	Medical Center Libraries, Moderator
Roger Parker	Drug and Poison Information Center
Ed Comer	HEALTH-U.C.
Marcia Tomlin	Brown County General Hospital
Bruce Erwine	Bethesda Hospital
Michael Keeney	Clermont County Hospital
Paula Dubeck	U.C. Department of Sociology
Branch Lotspeich	U.C. Department of Biomedical Communications
Roger Verny	Medical Center Libraries Media Resource Center

Representatives for Mercy Hospital and the Medical Center specialists involved in the three-way calling system are being arranged. The council has met twice in the last few months and has discussed policy priorities and evaluated some policy procedures. However, no policy will go into effect until adequate time has passed to study the initial system.

Slide/Tape Presentation

The TIN staff, with the help of MCL's Roger Verny, has produced a slide/tape presentation which describes and explains the system. This presentation, approximately thirteen minutes long, will be made available to anyone at the four site hospitals affiliated with the telecommunications grant. It will also be available in the Media Resources Center at the Health Sciences Library.

Hospital Profiles

During the next few months, background data about the staff at the four grant-affiliated hospitals will be collected. This data will be used to create a profile of the different staffs at each hospital. This profile, in turn, will help the research staff gain a better understanding of the informational needs and interests of the health-care providers at each site. Questionnaires attached to "The Scanner" will be distributed at each hospital; everyone's cooperation in returning them will be greatly appreciated and will facilitate our evaluation of the Telecommunications Information Network.

Equipment Installation

We regret that delivery delays and equipment problems have postponed the beginning of the grant. However, slow-scan equipment has been installed in at least one monitor location of each site and all hospitals except Clermont County Hospital are now connected with the Medical Center for transmission. As soon as their telephone coupler has been installed, the Clermont system will also become operable.

Bethesda North has decided to install a second monitor which will be located in the Emergency Department.

TIN Demonstrations

Members of the Telecommunications Information Network and Medical Center Libraries staff will be scheduling times for explanations and demonstrations of the system in the next several weeks. In the meantime, however, we encourage use of the network. If there are any questions or suggestions concerning the TIN, please contact the facilitator at your hospital or call Jack Kues or Melanie McGuire at the U.C. Health Sciences Library, 872-5545.



HE

SCANNER

number: 3

date: August 27, 1979

The equipment at the four Ohio hospitals involved with the Telecommunications Information Network -- Mercy Hospital in Hamilton; Clermont County Hospital in Batavia; Bethesda North Hospital in Cincinnati; and Brown County General Hospital in Georgetown -- are fully operational. Questions from each of these hospital sites have been handled by both the Medical Center Libraries and the Drug and Poison Information Center. Explanations and demonstrations of the network have been given by members of the TIN and MCL staff at different site locations during the past weeks and will continue through the coming months. In the meantime, we encourage use of the system.

If there are any questions or suggestions concerning the TIN, please contact the facilitator at your hospital, call Jack Kues or Melanie McGuire at the U.C. Health Sciences Library, 872-5545, or call Leonard Sigell or Roger Parker at the Drug and Poison Information Center, 872-5111.

Drug and Poison Information Center

For those of you who are not familiar with the Drug and Poison Information Center, we would like to acquaint you with its many resources:

THE STAFF: DPIC is staffed by pharmacologists, pharmacists, pediatricians, nurses, hospital pharmacy technologists, among others. Additional assistance is available, when needed, from the Center's many consultants. These staff members are available to assist in searching the literature about drug-related problems and in the interpretation of available information.

REFERENCE MATERIALS: DPIC maintains a specialized library of books and periodicals dealing with drug therapy, pharmacology, medicine, toxicology, chemistry, etc. DPIC also maintains special files of data and articles on a variety of drugs, classes of drugs, problems associated with pharmacology, etc.

POISINDEX: Considered by many the premier toxicology information resource, this microfilm system is a useful reference for many purposes; e.g. determining the ingredients of various products, drug identifications (by product code), plant toxicity, etc. Poisindex also gives management protocols for various classes of intoxicants. The referenced management protocols are reviewed by recognized authorities throughout the country. Material for Poisindex is updated quarterly.

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DE HAEN DRUGS IN USE: This is a current literature reference system abstracting clinical trials and experiences from over 600 domestic and international biomedical journals. The abstracts describe the purpose of the study or report, the patient/s, doses and routes, duration of exposure, results and author's conclusions. This system is updated monthly.

DRUGDEX: Drugdex is DPIC's most recent acquisition. This is a microfilm service which consists of two parts: (a) drug evaluations which review the actions, uses, adverse reactions, kinetics, fetal and maternal effects, monitoring parameters, routes of administration, interactions, etc. of various drugs; and (b) drug consults giving detailed and referenced answers to specific therapeutic questions. These questions have been posed to drug information centers across the country.

THERAPEUTIC CENTERS: Now in its eleventh year, this publication of the Departments of Medicine and Pharmacology (produced by the DPIC) offers articles written by faculty of the U.C. Medical Center. Topics of recent issues include: "Update on New Antibiotics," "Pollutants and Health," "Drug Abuse: A Current Perspective," "Rational Choice of Oral Analgesics," "Disorders of Sleep: Diagnosis and Treatment," and "Current Management of Rheumatoid Arthritis."

Slow-scan will provide visual access to all of the services and resources of DPIC between 8 AM and 9 PM weekdays. Of course, telephone access to the DPIC for drug and toxicology information is still available 24 hours a day by calling the same (513) 872-5111 number.

Here are examples of the 8,000 questions posed to DPIC each year by health professionals in the area:

- Is there evidence that doxepin produces less cardiotoxicity or less lowering of seizure threshold than other tricyclic antidepressants?
- Other than ammonium chloride and furosemide, what can be done in managing life-threatening PCP overdoses?
- How solid is the evidence implicating reserpine as a cause of breast cancer?
- What constitutes current therapy for ciguatera poisoning?
- Does cholestyramine bind methyldopa and/or imipramine?
- Are dose adjustments of fluphenazine (Proloxin) needed for patients in renal failure?

Hospital Profiles

We are continuing to collect background data about the staff at the four grant-affiliated hospitals. This data is needed to create a profile of the different staffs at each location. The profiles will enable the TIN research staff to gain a better understanding of the informational needs and interests of these health-care providers. The questionnaires were attached to the last "Scanner;" we would appreciate everyone's cooperation in returning them to facilitate our evaluation of the TIN.

Facilitator Change

Ruth Huffman has replaced Marsha Tomlin as facilitator at Brown County General Hospital and Mary Espelage has replaced Michael Keeney at Clermont County Hospital. Mary has also taken Mike's place on the Project Review Council.

Equipment Installation

A second compressor was recently installed in the Drug and Poison Information Center. This will enable us to transmit from DPIC and MCL simultaneously rather than relying alternately on a single compressor unit.

What is the Telecommunications Information Network (TIN)?

A system providing access to information resources at the University of Cincinnati Medical Center to answer your health-care questions via slow-scan television.

What is slow-scan television?

A new technology which transmits still images over telephone lines. In less than 1½ minutes you can receive pictures of printed material, X-rays, slides, 3-D models . . .

Who can use TIN?

Any person involved in health-care at the four hospitals associated with the network.

**Medical Center Libraries
and
Drug and Poison
Information Center**

Mercy Hospital
Clermont County Hospital
Brown County General Hospital
Bethesda North Hospital

What kind of questions can I ask TIN?

Any question concerning health care.

Who answers the questions?

Information specialists at both the Medical Center Libraries and the Drug and Poison Information Center. U.C. medical specialists are also available as information resources for TIN.

How do I use TIN?

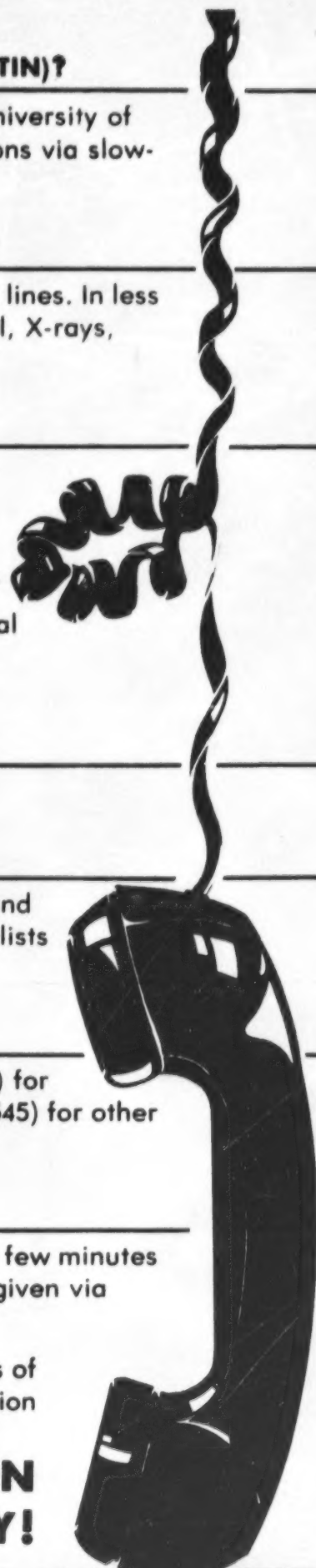
Telephone the Drug and Poison Information Center (872-5111) for drug-related questions or the Medical Center Libraries (872-5545) for other health-related questions.

What happens after I ask TIN a question?

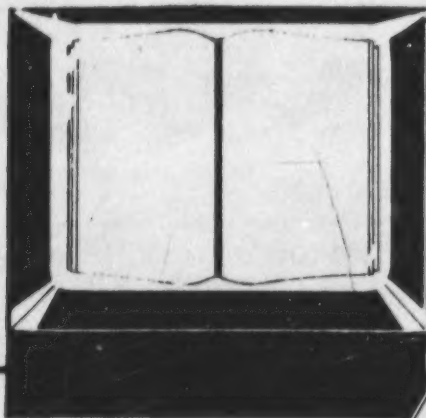
Depending on the nature of the question, research may take a few minutes to a few hours. You are then contacted and the information given via telephone and/or slow-scan television.

You now have direct access to all of the information resources of the Medical Center Libraries and the Drug and Poison Information Center.

**Remember: FAST INFORMATION
IS ONLY A SLOW-SCAN AWAY!**



**Drug and Poison Information
Center (DPIC) 872-5111
Telecommunications Information
Network (TIN) Office 872-5545**



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**Telecommunications
Information Network**

**Medical Center Libraries
University of Cincinnati
231 Bethesda Avenue
Cincinnati, Ohio 45267**

(513) 872-5545



APPENDIX F

Telecommunications Information Network Policies

Usage/System Access

All personnel on staff at the locations shall have access to the Telecommunications Information Network. This also includes all U.C. personnel on location there and the physicians holding admitting privileges at the hospital.

Hospital staff involved in the study may also include those from auxiliary sites e.g. Mercy Hospital North and South and Bethesda Base and Bethesda North.

A monitor will also be located at the office of the Health Education Alliance Through the University of Cincinnati (HEALTH-U.C.) presently located at Brown County General Hospital in Georgetown, Ohio. All non-hospital affiliated persons in the HEALTH-U.C. service area -- Adams, Brown, Butler, Clermont, Clinton, Hamilton, Highland, and Warren counties -- will have access to the Telecommunications Information Network through the HEALTH-U.C. office.

The Telecommunications Information Network is designed to provide on-demand information in response to specific medical questions. The system shall be used to access necessary information for better patient care rather than as a personal reference system. The system will not provide in-depth reference information as this is in violation of the Medical Center Libraries reference policy.

The Telecommunications Information Network will have several possible avenues available to convey information as quickly as necessary to the requestors:

- 1) Direct answer over telephone
- 2) Slow-scan television
- 3) Three-way conference-calling involving medical specialists
- 4) A combination of the above

If the question is very specific, an answer may be provided using only the telephone. If a visual component is necessary or requested, then the slow-scan system will be used. A three-way conference call can be initiated involving the requestor, the librarian, and a specialist at the U.C. Medical Center as an aid in answering the question. These methods may be used individually or in combination with each other.

The Relationship between the Medical Center Libraries and the Drug and Poison Information Center

The Telecommunications Information Network has two transmission sites at the University of Cincinnati Medical Center; the Health Sciences Library and the Drug and Poison Information Center. Requestors using the Telecommunications Information Network will make the decision which of these resource centers to telephone based on the type of question. Drug-related questions should be referred to the Drug and Poison Information Center and other medical questions should be referred to the Health Sciences Library. The telephone numbers of both resource centers will be made available at each of the site hospitals.

The Health Sciences Library and the Drug and Poison Information Center will respond to requests to the best of their ability. If a caller's request is clearly out of the scope of one of the resource centers, then the question will be referred to the other resource center or to one of the other resources available to the Telecommunications Information Network. In the case of complex questions (e.g. 50% drug-related and 50% other medical related) the Health Sciences Library will cooperate in responding to the request. This will be done by using the conference-calling line in the Telecommunications Office at the Health Sciences Library.

Medical Legal Issues/Ethics

The Telecommunications Information Network is activated by health-care providers at the remote sites. The Telecommunications Information Network specialists act as gatekeepers between the resources available through the Medical Center Libraries and the Drug and Poison Information Center and the requestor. The concept of "gatekeeper" implies that the information specialist has special skills in the organization and retrieval of a body of knowledge. This unique position does not require a detailed understanding of the content of this body of knowledge.

The Telecommunications Information Network specialists, using accepted search strategies, will retrieve relevant literature regardless of research bias. The final decision on the use of this information rests with the requestor.